

## DESCRIPTION OF TABLES AND CHARTS.

Table I gives the data ordinarily needed for climatological studies for about 158 Weather Bureau stations, making simultaneous observations at 8 a. m. and 8 p. m., daily, 75th meridian time, and for about 41 others making only one observation. The altitudes of the instruments above ground are also given.

Table II gives a record of precipitation, the intensity of which at some period of the storm's continuance equalled or exceeded the following rates:

Duration (minutes).....	5	10	15	20	25	30	35	40	45	50	60
Rates per hour (inches).....	3.00	1.80	1.40	1.20	1.08	1.00	0.94	0.90	0.87	0.84	0.80

It is impracticable to make this table sufficiently wide to accommodate on one line the record of accumulated falls that continue at an excessive rate for several hours. In this case the record is broken at the end of each 50 minutes, the accumulated amounts being recorded on successive lines until the excessive rate ends.

In cases where no storm of sufficient intensity to entitle it to a place in the full table has occurred the greatest precipitation of any single storm has been given, also the greatest hourly fall during that storm.

The tipping-bucket mechanism is *dismounted* and removed when there is danger of snow or water freezing in the same. Table II records this condition by entering an asterisk (\*).

Table III gives, for about 30 stations of the Canadian Meteorological Service, the means of pressure and temperature, total precipitation and depth of snowfall, and the respective departures from normal values except in the case of snowfall.

Chart I.—Hydrographs for several of the principal rivers of the United States.

Chart II.—Tracks of centers of high areas; and

Chart III.—Tracks of centers of low areas. The roman numerals show the chronological order of the centers. The figures within the circles show the days of the month: the letters *a* and *p* indicate, respectively, the observations at 8 a. m. and 8 p. m., 75th meridian time. Within each circle is also given (Chart II) the last three figures of the highest barometric reading, or (Chart III) the lowest reading reported at or near the center at that time, and in both cases as reduced to sea level and standard gravity.

Chart IV.—Temperature departures. This chart presents the departures of the monthly mean temperatures from the monthly normals. The normals used in computing the departures were computed for a period of 33 years (1873 to 1905) and are published in Weather Bureau Bulletin "R," Washington, 1908. Stations whose records were too short to justify the preparation of normals in 1908 have been provided with normals as adequate records became available, and all have been reduced to the 33-year interval 1873-1905. The shaded portions of the chart indicate areas of positive departures and unshaded portions indicate areas of negative departures. Generalized lines connect places having approximately equal departures of like sign. This chart of monthly

temperature departures in the United States was first published in the MONTHLY WEATHER REVIEW for July, 1909.

Chart V.—Total precipitation. The scale of shades showing the depth is given on the chart. Where the monthly amounts are too small to justify shading and over sections of the country where stations are too widely separated or the topography is too diversified to warrant reasonable accuracy in shading, the actual depths are given for a limited number of representative stations. Amounts less than 0.005 inch are indicated by the letter T, and no precipitation by 0.

Chart VI.—Percentage of clear sky between sunrise and sunset. The average cloudiness at each Weather Bureau station is determined by numerous personal observations between sunrise and sunset. The difference between the observed cloudiness and 100 is assumed to represent the percentage of clear sky, and the values thus obtained are the basis of this chart. The chart does not relate to the nighttime.

Chart VII.—Isobars and isotherms at sea level and prevailing wind directions. The pressures have been reduced to sea level and standard gravity by the method described by Prof. Frank H. Bigelow on pages 13-16 of the REVIEW for January, 1902. The pressures have also been reduced to the mean of the 24 hours by the application of a suitable correction to the mean of the 8 a. m. and 8 p. m. readings at stations taking two observations daily, and to the 8 a. m. or the 8 p. m. observation, respectively, at stations taking but a single observation. The diurnal corrections so applied will be found in the Annual Report of the Chief of the Weather Bureau, 1900-1901, volume 2, Table 27, pages 140-164.

The isotherms on the sea-level plane have been constructed by means of the data summarized in chapter 8 of volume 2 of the annual report just mentioned. The correction,  $t_0 - t$ , or temperature on the sea-level plane minus the station temperature as given by Table 48 of that report, is added to the observed surface temperature to obtain the adopted sea-level temperature.

The prevailing wind directions are determined from hourly observations at the great majority of the stations; a few stations having no self-recording wind-direction apparatus determine the prevailing direction from the daily or twice-daily observations only.

Chart VIII.—Total snowfall. This is based on the reports from regular and cooperative observers and shows the depth in inches and tenths of the snowfall during the month. In general, the depth is shown by lines inclosing areas of equal snowfall, but in special cases figures are also given. Chart VIII is published only when the general snow cover is sufficiently extensive to justify its preparation.

Chart IX.—Average values of pressure, temperature, and prevailing wind directions, and storm tracks over the North Atlantic Ocean, for the corresponding month of last year.

## MONTHLY WEATHER REVIEW.

JANUARY, 1916

TABLE I.—Climatological data for United States Weather Bureau stations, January, 1916.

Districts and stations.	Elevation of instruments.		Pressure.				Temperature of the air.								Precipitation.				Wind.												
	Banometer above sea level.	Thermometer above ground.	Anerometer above ground.	Station, reduced to mean of 24 hours.	Sea level, reduced to mean of 24 hours.	Departure from normal.	Mean max+mean min.+2.	Mean max+mean min.-2.	Maximum.	Minimum.	Date.	Mean maximum.	Mean minimum.	Greatest daily range.	Mean wet thermometer.	Mean temperature of the dew point.	Mean relative humidity.	Total.	Departure from normal.	Days with 0.01 or more.	Total movement.	Prevailing direction.	Maximum velocity.	Clear days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall.	Snow on ground at end of month.			
	Ft.	Ft.	Ft.	In.	In.	In.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	%	°F.	°F.	%	In.	In.	Miles											
New England.																															
Eastport.	76	67	85	30.00	30.09	+ 0.09	22.6	+ 2.5	48	22	31	- 6	18	14	38	21	16	73	1.86	- 2.0	15	10,467	w.	42	w.	23	6	12	13	6.5	14.2
Greenville.	1,070	82	117	28.88	30.10	- 1.22	15.1	- 2.4	47	22	28	- 16	18	4	44	21	16	73	2.35	- 1.7	11	11,781	sw.	48	nw.	28	12	2	16	5.7	16.2
Portland, Me.	103	82	117	30.03	30.16	+ .11	28.6	+ 4.6	61	28	36	- 9	15	19	41	23	16	67	2.15	- 1.7	11	11,781	sw.	28	nw.	25	12	7	12	5.4	12.1
Concord.	288	70	79	29.84	30.17	+ .12	25.3	+ 4.6	62	26	36	- 9	18	16	36	21	16	73	1.22	- 2.1	8	4,159	rw.	48	nw.	10	4	8	19	7.4	8.6
Burlington.	404	11	48	29.65	30.15	+ .10	23.2	+ 2.7	61	60	28	- 16	9	13	19	12	16	67	0.87	- 1.0	13	13,208	s.	48	w.	28	9	7	15	6.0	4.8
Northfield.	876	12	60	29.17	30.16	+ .11	22.2	+ 2.7	7.1	60	28	- 16	8	10	47	19	16	83	1.14	- 1.4	14	7,355	s.	34	sw.	5	5	7	19	7.3	11.9
Boston.	125	115	188	30.04	30.18	+ .13	33.0	+ 6.0	68	26	36	- 9	15	24	36	29	24	70	1.23	- 2.6	9	8,755	sw.	43	w.	20	7	6	18	7.3	0.5
Nantucket.	12	90	30.17	30.18	+ .14	33.9	+ 6.9	53	28	41	10	15	28	23	31	28	82	2.03	- 1.4	13	16,782	sw.	47	sw.	3	8	7	16	6.6	1.4	
Block Island.	26	11	46	30.17	30.20	+ .13	34.6	+ 3.2	55	28	41	9	15	28	23	32	29	80	1.69	- 2.2	13	16,201	sw.	66	nw.	3	8	7	16	6.6	1.4
Narragansett Pier.	9						32.1	+ 3.7	65	26	49	3	15	21	30	16	21	70	1.66	- 2.0	13					12	9	10		0.8	
Providence.	160	215	251	30.01	30.19	+ .13	32.2	+ 5.0	64	26	41	3	15	24	35	29	24	74	1.35	- 3.0	10	10,478	sw.	60	nw.	28	11	6	14	6.0	0.8
Hartford.	159	122	140	30.02	30.21	+ .14	31.8	+ 6.3	67	27	40	5	15	29	34	28	23	71	1.18	- 1.2	9	6,619	s.	37	nw.	3	12	5	14	6.0	1.8
New Haven.	106	117	155	30.09	30.21	+ .13	33.0	+ 5.7	65	28	41	6	15	25	34	29	24	72	1.55	- 2.4	17	7,164	s.	36	nw.	4	9	8	14	5.9	1.6
Middle Atlantic States.							38.0	+ 6.4										72	1.70	- 1.5									6.5		
Albany.	97	102	115	30.08	30.20	+ .13	29.2	+ 6.7	56	27	37	0	9	22	34	29	21	75	1.80	- 0.8	12	7,288	s.	39	s.	10	8	5	18	6.8	0.6
Binghamton.	871	10	69	29.23	30.18	+ .10	31.4	+ 8.3	63	27	39	4	17	23	36	31	24	65	1.08	- 2.7	11	15,016	sw.	67	nw.	23	4	12	15	7.0	1.8
New York.	314	414	454	29.98	30.23	+ .13	35.4	+ 5.2	66	27	43	7	15	28	31	31	24	67	1.61	- 1.2	14	5,702	rw.	28	sw.	31	5	10	16	6.8	1.4
Harrisburg.	374	94	104	29.84	30.26	+ .16	35.5	+ 6.8	68	27	43	9	18	26	35	31	25	68	1.50	- 1.9	14	5,736	sw.	34	nw.	6	7	11	13	6.6	2.5
Philadelphia.	117	123	190	30.13	30.26	+ .15	38.2	+ 6.4	69	27	46	9	18	31	28	34	28	69	1.73	- 1.8	14	5,773	rw.	29	nw.	3	7	7	17	6.8	1.6
Reading.	325	81	98	29.89	30.26		35.5		71	27	43	7	18	28	30	32	28	74	2.07	- 1.7	13	6,201	sw.	37	w.	3	5	10	16	6.8	4.1
Scranton.	805	111	119	29.33	30.22	+ .13	33.6	+ 8.1	69	27	42	4	15	25	30	29	25	74	2.07	- 0.7	13	6,201	sw.	26	sw.	10	7	3	21	7.4	3.7
Atlantic City.	52	37	49	30.20	30.23	+ .17	37.0	+ 4.5	69	28	44	10	15	31	26	34	30	79	2.00	- 1.4	12	6,538	sw.	30	nw.	3	6	12	13	6.5	4.0
Cape May.	18	13	49	30.26	30.29	+ .17	37.4	+ 3.3	65	28	44	12	15	31	29	31	27	79	1.62	- 1.8	15	7,412	s.	30	nw.	5	8	10	13	5.9	1.3
Sandy Hook.	22	10	57	30.21	30.23		35.0		68	27	43	7	18	28	32	32	27	74	1.26	- 1.9	13	9,218	sw.	53	nw.	17	6	9	16	6.9	5.2
Trenton.	190	159	133	30.02	30.21		35.5		68	27	43	7	18	28	32	32	27	74	1.26	- 1.9	13	9,218	sw.	42	nw.	17	6	9	16	6.9	5.2
Baltimore.	123	100	113	30.13	30.27	+ .13	39.5	+ 6.1	71	27	47	10	18	32	35	29	29	70	1.51	- 1.7	14	6,825	sw.	36	n.	14	7	7	17	6.6	1.5
Washington.	112	62	85	30.13	30.26	+ .13	39.8	+ 8.0	71	27	49	8	19	31	29	35	29	69	1.57	- 1.8	13	5,257	s.	35	nw.	3	7	9	15	6.5	5.7
Lynchburg.	681	153	185	29.51	30.27	+ .14	43.2	+ 7.4	72	28	53	10	18	34	34	37	32	72	0.99	- 2.0	9	6,057	sw.	34	nw.	3	6	12	13	6.4	1.7
Norfolk.	91	170	205	30.18	30.29	+ .16	47.0	+ 6.6	72	28	53	17	18	38	32	42	37	75	2.07	- 1.3	10	11,048	sw.	48	sw.	5	8	12	11	5.8	T.
Richmond.	144	11	52	30.12	30.28	+ .15	44.0	+ 6.0	74	28	54	12	18	34	29	39	34	74	1.51	- 1.5	10	9,169	s.	37	sw.	5	7	10	14	6.2	2.0
Wytheville.	2,293	49	55	27.82	30.27	+ .13	40.4	+ 7.4	66	12	50	4	18	31	35	30	33	81	3.57	- 0.7	13	5,109	w.	32	sw.	1	8	9	14	6.0	0.3
South Atlantic States.							52.8	+ 7.6										81	1.62	- 2.3									5.9		
Asheville.	2,255	70	84	27.86	30.28	+ .13	44.8	+ 9.4	67	1	54	6	18	36	34	40	36	76	2.54	- 2.1	12	8,197	se.	33	nw.	17	8	6	17	6.6	T.
Charlotte.	773	153	181	29.42	30.28	+ .13	47.6	+ 7.2	71	2	56	18	18	40	24	44	40	79	1.66	- 2.6	12	8,279	sw.	37	nw.	17	7	5	19	6.3	T.
Hatteras.	11	52	120	30.27	30.28	+ .14	51.2	+ 5.4	72	27	53	24	18	44	24	48	45	85	1.28	- 3.7	12	11,459	sw.	42	ne.	7	8	14	9	5.6	T.
Manteo.	12	4	46				49.6		75	2	60	15	18	39	31	42	37	72	2.76	- 1.9	6					15	7	9			
Raleigh.	376	103	110	29.88	30.29	+ .16	47.8	+ 7.4	73	26	57	16	18	38	31	42	37	72	2.69	- 0.9	14	6,363	sw.	28	nw.	3	7	8	16	6.6	
Wilmington.	78	81	91	30.21	30.30	+ .16	55.9	+ 7.3	76	2	61	20	18	43	36	47	44	80	1.92	- 2.4	10	10,964	sw.	26	ne.	23	12	11	8	5.0	T.
Charleston.	48	11	92	30.23	30.28	+ .13	55.9	+ 6.6	77	2	64	28	18	48	31	51	49	84	1.34	- 2.1	9	7,900	se.	37	ne.	23	10	12	9	5.2	
Columbia, S. C.	351	41	57	29.90	30.30	+ .15	52.9	+ 7.8	77	12	62	29	18	44	34	47	43	77	1.22	- 2.0	11	5,936	se.	35	sw.	22	7	9	15	6.2	
Augusta.	180	89	97	30.09	30.28	+ .12	54.0	+ 8.1	78	12	63	24	18	45	35	49	47	82	0.75	- 3.4	5	5,024	s.	24	ne.	22	10	7	14	5.8	
Sav																															

TABLE I.—Climatological data for United States Weather Bureau stations, January, 1916—Continued.

Districts and stations.	Elevation of instruments.			Pressure.			Temperature of the air.						Precipitation.			Wind.														
	Bartometer above sea level.	Thermometer above ground.	Anerometer above ground.	Station, reduced to mean of 24 hours.	Sea level, reduced to mean of 24 hours.	Departure from normal.	Mean max. + mean min. + 2.	Departure from normal.	Mean maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.	Mean wet thermometer.	Temperature of the dew point.	Total movement.	Miles per hour.	Prevailing direction.	Maximum velocity.	Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Show on ground at end of month.				
	Ft.	Ft.	Ft.	In.	In.	In.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	% 78	In. 6.11 + 2.3	Miles	Date.	In.	In.	In.	In.	In.						
<i>Ohio Valley and Tennessee.</i>																														
Chattanooga.....	762	189	213	29.45	30.28	+ 0.12	47.2 + 6.6	72	11	55	12	39	31	43	38	73	4.75 + 0.8	17	7,006	s.	49	sw.	12	6	5	20	7.1	0.9		
Knoxville.....	996	93	100	29.18	30.26	+ 0.11	45.0 + 7.5	72	26	54	10	17	36	36	41	37	76	5.23 + 0.3	13	4,103	sw.	32	sw.	21	6	5	18	7.0	1.0	
Memphis.....	399	76	97	29.79	30.23	+ 0.07	46.2 + 5.9	75	11	54	13	13	38	52	43	40	77	7.18 + 2.0	14	7,730	s.	38	n.	12	9	1	21	7.3	1.1	
Nashville.....	546	168	191	29.65	30.25	+ 0.09	44.6 + 6.6	74	12	54	17	36	46	41	38	78	7.62 + 2.8	14	9,149	se.	57	se.	12	7	4	20	6.8	0.5		
Lexington.....	989	193	230	29.14	30.24	+ 0.11	39.7 + 6.7	69	30	49	- 4	17	31	34	56	5.65 + 1.8	12	12,760	s.	52	sw.	5	7	17	17	6.9	8.7			
Louisville.....	525	219	255	29.64	30.24	+ 0.07	40.0 + 5.7	72	12	49	0	17	31	52	36	32	76	8.16 + 4.3	17	11,355	s.	52	s.	12	6	10	15	6.9	4.7	
Evansville.....	431	72	82	29.31	30.21	+ 0.07	38.6 + 6.3	69	12	48	3	17	30	57	33	81	8.73 + 5.0	15	10,943	s.	50	s.	12	7	8	16	6.8	0.6		
Indianapolis.....	822	194	230	29.28	30.20	+ 0.08	33.8 + 5.6	68	12	44	- 3	14	24	61	31	28	81	8.55 + 3.7	15	10,773	s.	44	w.	13	9	5	17	6.8	0.6	
Terre Haute.....	575	96	129	29.59	30.19		33.8 + 5.6	65	12	44	- 3	14	24	61	31	28	81	7.58 + 2.5	15	9,410	s.	45	s.	12	5	8	18	7.1	1.4	
Cincinnati.....	624	11	51	29.52	30.22	+ 0.10	37.6 + 5.3	70	12	48	- 4	17	26	58	31	31	80	5.84 + 2.5	19	7,404	s.	34	s.	12	6	5	20	7.0	5.3	
Columbus.....	824	173	222	29.31	30.21	+ 0.10	36.0 + 7.4	65	12	45	- 4	17	27	33	33	30	82	5.02 + 2.1	16	9,985	s.	46	w.	13	6	9	16	6.7	1.8	
Dayton.....	898	181	216	29.20	30.18		36.4 + 7.5	67	12	45	- 3	17	27	35	33	30	83	5.67 + 2.7	16	10,207	sw.	49	s.	12	6	6	23	7.9	1.3	
Pittsburgh.....	842	353	410	29.28	30.21	+ 0.07	37.5 + 6.8	69	27	46	- 3	17	28	38	34	29	73	5.51 + 0.6	15	9,398	sw.	52	w.	13	4	2	19	7.6	8.3	
Elkins.....	1,940	41	50	28.13	30.27	+ 0.15	37.8 + 8.8	72	12	50	- 5	8	26	44	33	29	79	6.31 + 3.0	13	3,462	w.	28	w.	13	8	5	18	7.2	3.2	
Parkersburg.....	638	77	84	29.57	30.25	+ 0.13	38.8 + 7.5	74	27	49	- 1	17	28	42	35	32	79	5.34 + 2.2	17	4,902	se.	32	w.	13	8	5	18	7.2	3.2	
<i>Lower Lake Region.</i>							31.4 + 7.1									78	2.96 + 0.3										7.6			
Buffalo.....	767	247	280	29.27	30.13	+ 0.06	32.0 + 7.3	66	27	40	- 2	17	24	30	29	25	78	2.96 - 0.3	20	18,390	sw.	76	w.	13	3	9	19	7.8	10.9	
Canton.....	445	10	61	28.62	30.12		25.0 + 8.7	58	25	36	- 8	14	14	44	23	25	2.52 + 0.6	19	11,367	sw.	46	sw.	13	5	5	25	8.2	1.2		
Oswego.....	335	76	91	29.75	30.14	+ 0.07	30.0 + 6.1	61	27	33	- 8	14	22	36	23	25	81	2.95 - 0.6	14	11,727	s.	39	sw.	22	1	5	23	8.4	5.7	
Rochester.....	523	97	113	29.58	30.15	+ 0.09	32.4 + 8.4	63	27	41	2	17	24	32	29	24	72	2.13 + 1.0	14	8,718	s.	39	sw.	13	1	5	23	8.4	5.5	
Syracuse.....	597	97	113	29.49	30.16	+ 0.09	31.1 + 8.1	64	27	40	1	14	22	44	23	23	73	2.00 + 0.1	17	12,500	s.	48	nw.	3	2	5	23	8.1	3.6	
Erie.....	714	130	166	29.35	30.14	+ 0.06	34.4 + 7.9	67	27	43	- 4	17	26	30	31	26	73	2.23 + 0.8	18	15,184	sw.	54	se.	12	2	5	20	7.7	3.9	
Cleveland.....	763	190	201	29.32	30.17	+ 0.06	34.8 + 8.6	69	27	44	- 10	17	26	37	31	27	77	2.40 + 0.0	17	12,733	s.	53	s.	10	5	5	21	8.6	3.1	
Sandusky.....	629	62	103	29.46	30.16	+ 0.07	33.6 + 7.3	68	27	42	- 4	17	25	37	30	26	77	3.62 + 1.5	15	11,945	w.	46	w.	13	3	12	16	7.3	3.9	
Toledo.....	628	208	243	29.46	30.16	+ 0.07	32.0 + 6.4	66	27	40	- 3	17	24	37	30	26	81	4.53 + 2.6	16	14,309	sw.	54	sw.	13	8	7	16	6.4	4.6	
Fort Wayne.....	856	113	124	29.22	30.18		30.4 + 3.5	65	27	39	- 3	17	23	46	28	24	80	6.45 + 1.4	14	9,373	s.	38	s.	27	7	9	16	6.6	9.8	
Detroit.....	730	218	245	29.32	30.14	+ 0.06	30.0 + 5.7	61	27	38	- 2	17	22	35	28	25	84	4.31 + 2.3	13	10,372	sw.	50	w.	13	6	8	17	7.0	1.1	
<i>Upper Lake Region.</i>							21.6 + 3.3									82	3.27 + 1.2											7.7		
Alpena.....	609	13	92	29.37	30.06	+ 0.02	24.0 + 5.3	50	27	31	- 2	16	17	30	22	20	85	2.00 - 0.2	19	10,852	w.	52	w.	22	1	11	19	8.0	7.2	1.0
Escanaba.....	612	54	60	29.38	30.06	+ 0.01	17.0 + 2.5	41	21	25	- 15	6	9	43	16	12	79	2.12 + 0.6	18	8,459	nw.	40	nw.	22	10	8	13	8.1	3.5	
Grand Haven.....	632	54	92	29.39	30.10	+ 0.03	28.2 + 3.7	61	27	35	- 14	14	21	35	23	21	81	2.95 - 0.6	21	12,686	w.	52	w.	22	5	4	28	8.3	11.6	
Grand Rapids.....	707	70	87	29.32	30.11	+ 0.05	28.7 + 4.9	62	27	36	- 15	17	22	41	27	24	81	2.95 + 1.0	14	8,718	s.	39	sw.	13	1	5	23	8.4	8.5	
Houghton.....	684	62	72	29.28	30.04	- 0.01	15.6 + 1.1	43	24	32	- 10	7	8	28	5	14	3.1 + 1.0	20	7,055	s.	31	w.	22	2	4	27	8.1	3.6		
Lansing.....	878	11	62	29.14	30.11		27.6 + 5.6	61	21	35	- 2	17	20	41	26	23	83	3.11 + 1.0	20	7,055	s.	31	w.	22	2	3	26	8.8	1.1	
Ludington.....	637	60	66	29.35	30.07		26.6 + 5.5	58	27	33	- 6	16	20	34	25	23	85	3.33 + 1.0	21	11,766	w.	40	w.	22	2	3	23	8.8	1.0	
Marquette.....	734	77	111	29.23	30.07	+ 0.03	17.4 + 1.5	44	24	35	- 13	6	10	36	12	12	78	3.05 + 1.0	14	9,974	sw.	55	w.	22	3	6	22	8.2	20.7	
Port Huron.....	638	70	120	29.40	30.12	+ 0.06	28.6 + 6.8	56	27	36	- 17	17	21	37	27	24	84	3.18 + 1.3	15	10,759	sw.	38	sw.	13	5	12	17	7.5	1.7	
Saginaw.....	641	48	82	29.39	30.10		27.6 + 5.5	62	27	35	- 17	13	20	40	24	22	88	2.51 + 0.2	15	9,809	s.	40	w.	22	5	12	22	8.6	1.8	
St. Ignace.....	614	11	61	29.32	30.05	+ 0.05	28.8 + 5.1	44	24	35	- 17	17	9	32	18	12	81	3.18 + 1.0	24	8,280	e.	45	w.	21	10	4	15	8.6	2.7	
Chicago.....	823	110	144	29.38	30.08	+ 0.02	18.6 + 4.0	47	24	27	- 15	14	10	41	17	13	77	2.39 + 0.7	10	10,455	s.	42	nw.	11	5	7	15	8.6	3.2	
Green Bay.....	617	109	144	29.38	30.08	+ 0.02	18.6 + 4.0	47	24	27	- 15	13	15	49	23	20	82	3.08 + 1.1	10	9,316	w.	44	e.	11	8	8	12	6.3	8.9	
Milwaukee.....	681	119	133	29.33	30.10	+ 0.02	24.0 + 4.2	56	27	33	- 15	13	15	50																

TABLE I.—Climatological data for United States Weather Bureau stations, January, 1916—Continued.

Districts and stations.	Elevation of instruments.			Pressure.			Temperature of the air.						Precipitation.			Wind.			Maximum velocity.											
	Barometer above sea level.	Thermometer above ground.	Anerometer above ground.	Station, reduced to mean of 24 hours.	Sea level, reduced to mean of 24 hours.	Departure from normal.	Mean max. + mean min. + 2.	Departure from normal.	Mean maximum.	Date.	Mean minimum.	Date.	Mean minimum.	Greatest daily range.	Mean wet thermometer.	Total.	Days with 0.01 or more.	Total movement.	Prevailing direction.	Miles per hour.	Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall.					
	Ft.	Ft.	Ft.	In.	In.	In.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	%	In.	In.	Miles.	Date.					In.	In.						
<i>Northern Slope.</i>																									0-10 5.6					
Havre.....	2,505	11	44	27.42	30.30	+0.20	-13.3	-26.8	30	21	-4	-57	27	-23	43	-13	-15	87	1.75	+ 1.1	10	5,621	w.	36	sw.	21	12	15	6.1	17.5 22.5
Helena.....	4,110	87	114	25.70	30.15	+0.03	-1.2	-21.2	53	28	-8	-29	10	-60	-3	-9	74	1.26	+ 0.3	14	4,562	sw.	39	sw.	23	16	11	6.5	17.2 6.1	
Kalispell.....	2,962	11	34	27.55	30.31	+0.19	-4.1	-15.2	45	23	-13	-22	31	-4	35	1	84	95	+ 0.4	17	3,989	nw.	24	s.	8	16	6	19.2	8.2	
Missoula.....	2,371	26	48	27.55	30.20	+0.19	-6.3	-20.8	43	23	-4	-32	12	-17	46	-8	-12	77	1.38	+ 0.8	9	3,874	nv.	27	nw.	9	17	7	4.1	15.3 13.1
Rapid City.....	3,259	50	58	26.56	30.20	+0.19	-9.6	-11.9	59	3	-22	-33	12	-3	58	6	-2	62	0.57	+ 0.1	7	6,468	w.	48	s.	9	14	12	5.4	6.2 1.0
Cheyenne.....	6,039	84	101	23.28	30.03	-0.02	17.6	-8.0	53	23	-28	-19	16	7	37	15	9	67	0.63	+ 0.2	9	9,793	w.	70	w.	21	7	10	14	6.3 2.0
Lander.....	5,372	60	69	24.47	30.11	-0.01	8.6	-8.8	53	23	-22	-34	20	-9	55	5	1	68	1.03	+ 0.6	6	3,780	e.	43	s.	19	8	12	8.5	11.4 9.0
Sheridan.....	3,790	10	47	26.03	30.20	-0.03	1.8	-6.4	56	3	14	-29	12	-10	67	-1	-5	82	0.92	-	11	3,607	n.	34	s.	9	10	12	9.5	10.0 6.4
Yellowstone Park.....	6,200	11	48	23.64	30.05	-0.03	6.7	-10.9	38	23	15	-31	37	-2	42	6	2	78	2.60	+ 0.4	17	1,130	s.	37	s.	21	4	7	20	7.2 31.2
North Platte.....	2,821	11	51	27.11	30.20	+0.08	15.0	-6.4	56	23	-26	-22	13	4	39	11	8	70	0.85	+ 0.4	12	5,351	w.	27	nw.	1	13	7	11	7.9 4.2
<i>Middle Slope.</i>							26.0	-3.1																	6.0					
Denver.....	5,201	129	172	24.58	30.03	-0.02	22.8	-6.3	65	4	35	-12	12	11	42	18	10	65	0.53	+ 0.1	8	5,403	sw.	42	sw.	9	8	16	7	5.4 9.0
Pueblo.....	4,885	80	88	25.18	30.00	-0.05	27.1	-2.0	68	8	40	-8	29	14	54	22	14	64	0.22	+ 0.1	8	5,407	nw.	56	w.	9	15	9	7	4.3 5.8
Concordia.....	1,392	50	58	28.64	30.19	+0.03	21.5	-2.9	63	4	30	-16	13	13	32	19	17	87	1.34	+ 0.6	14	7,010	nw.	32	nw.	12	5	11	15	9.7 4.2
Dodge.....	2,509	11	51	27.44	30.16	+0.05	23.8	-3.5	73	4	35	-16	13	18	43	24	21	83	1.90	+ 1.1	13	10,939	s.	48	sw.	4	9	7	15	6.3 2.1
Wichita.....	1,358	139	153	28.64	30.14	+0.01	27.1	-2.6	68	4	36	-11	13	18	40	30	28	84	4.28	+ 2.9	12	12,549	n.	44	n.	5	10	16	7.2	2.7 2.0
Oklahoma.....	1,214	10	47	28.82	30.15	+0.04	33.4	-1.3	68	4	43	-4	13	24	40	30	28	84	4.28	+ 2.9	12	12,549	n.	44	n.	11	12	9	10	5.0 0.4
<i>Southern Slope.</i>							44.5	+ 3.0																	6.0					
Abilene.....	1,738	10	52	28.25	30.03	-0.01	45.3	+ 2.6	81	11	56	9	13	34	47	38	32	69	0.40	- 0.5	9	8,477	n.	41	s.	20	5	4	22	7.0 0.1
Amarillo.....	3,676	10	49	26.23	30.05	-0.01	35.2	+ 1.3	74	9	49	1	13	21	55	29	23	70	0.36	- 0.2	5	8,740	sw.	36	sw.	4	14	9	8	4.7 2.5
Del Rio.....	944	64	71	29.04	30.04	-0.02	55.4	+ 5.2	80	30	64	24	17	47	33	..	..	60	-0.02	- 0.2	10	6,976	se.	38	nw.	12	8	7	16	6.6 5.2
Roswell.....	3,566	75	85	26.34	30.00	-0.04	42.1	-2.9	77	9	55	13	17	30	44	34	25	54	0.44	- 0.1	5	5,973	s.	44	sw.	11	12	9	10	5.0 0.4
<i>Southern Plateau.</i>							39.4	- 1.3																	4.8					
El Paso.....	3,763	110	133	26.17	29.96	-0.05	50.4	+ 6.3	74	6	62	23	13	33	39	40	28	45	0.66	+ 0.2	4	8,704	w.	55	sw.	11	9	15	7	5.0
Santa Fe.....	7,013	57	66	23.15	30.01	-0.03	30.6	+ 2.1	52	3	39	2	31	22	32	26	22	75	3.02	+ 2.4	17	4,998	sw.	30	se.	28	9	14	15	5.7 2.5
Flagstaff.....	6,908	8	57	23.29	29.94	-0.24	24.6	-2.1	48	23	36	-25	31	13	45	21	16	76	8.16	-	17	..	54	sw.	28	10	13	8	54.4 3.4	
Phoenix.....	1,108	76	81	28.83	30.01	-0.03	50.8	+ 0.8	69	3	60	31	12	42	31	45	39	69	2.34	+ 1.2	11	3,828	e.	28	s.	23	10	11	10	5.3
Yuma.....	141	9	54	29.88	30.01	-0.04	53.4	-1.3	72	5	64	28	12	43	34	32	46	38	0.52	+ 0.1	7	4,502	ne.	39	s.	27	20	5	6	3.2
Independence.....	3,910	11	42	25.88	29.96	-0.11	26.7	-13.8	52	27	37	-2	21	16	..	..	..	8.69	+ 7.8	12	3,942	n.	48	se.	27	5	12	14	75.7 18.5	
<i>Middle Plateau.</i>							24.2	- 4.2																	7.0					
Reno.....	4,532	74	81	25.27	29.93	-0.24	22.8	-9.7	48	22	33	-17	21	13	43	21	18	79	6.76	+ 4.8	17	4,217	w.	38	w.	8	7	16	6.8	65.7 16.1
Topopah.....	6,090	12	20	23.87	29.97	-0.24	23.6	-1.9	51	3	34	4	20	21	32	25	20	85	2.02	+ 1.3	13	8,600	se.	43	se.	3	10	4	17	6.2 16.1
Winnemucca.....	4,344	18	56	25.43	29.92	-0.24	22.1	-6.7	51	3	33	-15	21	11	45	21	14	81	2.21	+ 1.2	15	6,294	w.	42	sw.	28	5	19	7.1	20.8 5.6
Modena.....	5,479	19	43	24.46	29.93	-0.17	44.4	-3.1	44	3	30	-17	23	15	39	23	20	80	3.47	+ 2.3	23	8,319	sw.	74	s.	27	7	17	6.8	21.1 3.5
Salt Lake City.....	4,360	147	189	25.47	29.92	-0.23	29.4	+ 0.6	52	8	37	8	12	22	22	26	21	71	1.96	+ 0.6	15	6,356	nw.	48	s.	8	3	8	20	7.9 19.8 9.6
Grand Junction.....	4,602	82	96	25.30	29.98	-0.08	22.5	-2.2	50	28	32	-7	31	13	34	21	18	85	1.13	+ 0.7	16	3,842	nw.	51	sw.	28	4	8	19	7.5 15.2 2.8
<i>Northern Plateau.</i>							19.9	- 8.9																	7.7					
Baker.....	3,471	48	53	26.26	29.96	-0.20	16.2	-7.7	46	23	25	-11	16	8	28	16	12	80	0.85	- 0.5	14	4,772	se.	24	se.	20	6	6	19	6.9 10.4
Boise.....	2,739	78	86	27.04	29.96	-0.20	27.4	-1.9	51	3	34	4	20	21	32	25	20	72	2.02	+ 1.3	13	8,277	se.	32	se.	2	1	3	27	13.6 3.4
Lewiston.....	757	40	48	29.16	30.00	-0.16	17.8	-16.7	57	23	26	-13	17	10	34	21	16	72	1.65	+ 0.1	12	3,283	e.	28	s.	21	4	7	20	7.1 21.8 4.2
Pocatello.....	4,477	48	54	25.31	29.06	-0.14	23.0	-2.1	44	3	30	8	17	16	28	21	17	70	2.44	+ 1.8	15	7,559	se.	37	f.w.	9	1	19	6.9 23.1 7.0	
Spokane.....	1,929	101	110	27.85	29.98	-0.14	18.6	-10.1	49	23	23	-11	31	10	27	16	11	78	1.88	- 0.4	20	5,326	ne.	36	sw.	20	3	9	19	7.5 18.1 3.5
Walla Walla.....	991	57	65	28.86	29.98	-0.17	18.6	-14.6	59	23	25	-7	16	12	37	17	14	85	2.79	+ 0.8	18	3,5								

TABLE II.—Accumulated amounts of precipitation for each 5 minutes, for the principal storms in which the rate of fall equaled or exceeded 0.25 inch in any 5 minutes, or 0.80 in 1 hour, during January, 1916, at all stations furnished with self-registering gages.

Stations.	Date.	Total duration.		Total amount of precipitation.	Excessive rate.		Amount before excessive began.	Depths of precipitation (in inches) during periods of time indicated.													
		From—	To—		Began—	Ended—		5 min.	10 min.	15 min.	20 min.	25 min.	30 min.	35 min.	40 min.	45 min.	50 min.	60 min.	80 min.	100 min.	120 min.
Ahline, Tex.	20			0.16															0.16		
Albany, N. Y.	2			0.67														*			
Alpena, Mich.	1-2			0.51														*			
Amarillo, Tex.	16-17			0.17														*			
Anniston, Ala.	31 Feb. 2	3:13 p. m.	D. N. a.m.	3.09	4:43 p. m.	5:07 p. m.	0.12	0.18	0.29	0.46	0.52	0.60									
Asheville, N. C.	22			0.59														.46			
Atlanta, Ga.	31			0.84														.30			
Atlantic City, N. J.	2			0.37														.19			
Augusta, Ga.	13			0.31														.24			
Baker, Ore.	14			0.20														*			
Baltimore, Md.	22			0.19														.14			
Bentonville, Ark.	20-21	7:42 p. m.	7:30 a. m.	1.98	12:22 a. m.	1:03 a. m.	.20	.15	.37	.44	.48	.56	0.62	0.69	0.76	0.81					
Binghamton, N. Y.	12-13			0.28														.13			
Birmingham, Ala.	21-22	8:35 p. m.	7:21 a. m.	2.54	12:46 a. m.	1:45 a. m.	.59	.12	.25	.34	.48	.54	.61	.70	.88	.98	1.08	1.21			
Bismarck, N. Dak.	28-29			0.31														*			
Block Island, R. I.	10			0.74														.21			
Boise, Idaho.	25			0.35														*			
Boston, Mass.	2			0.50														.11			
Buffalo, N. Y.	1			0.63														*			
Burlington, Vt.	2			0.43														*			
Cairo, Ill.	30-31	7:05 p. m.	3:45 a. m.	2.54	7:57 p. m.	8:47 p. m.	.17	.10	.21	.32	.38	.42	.50	.58	.71	.75	.81	*			
Canton, N. Y.	13			0.58														*			
Charles City, Iowa.	26-27			0.93														.20			
Charleston, S. C.	16			0.28														.14			
Charlotte, N. C.	6			0.26														.54			
Chattanooga, Tenn.	21-22			1.83														*			
Cheyenne, Wyo.	23			0.18														*			
Chicago, Ill.	19-21			2.01														*			
Cincinnati, Ohio.	12	3:15 p. m.	8:00 p. m.	0.91	3:44 p. m.	4:05 p. m.	.08	.21	.27	.33	.41	.45						.18			
Cleveland, Ohio.	5			0.30														*			
Columbia, Mo.	26-27			1.88														.18			
Columbia, S. C.	13			0.33														.38			
Columbus, Ohio.	9-12			2.00														*			
Concord, N. H.	2			0.47														*			
Concordia, Kans.	25-26			0.25														.03			
Corpus Christi, Tex.	19			0.08														*			
Davenport, Iowa.	19-21			1.29														*			
Dayton, Ohio.	11-12			1.68														*			
Del Rio, Tex.	20			0.44														.40			
Denver, Colo.	17			0.28														*			
Des Moines, Iowa.	1			0.61														.27			
Detroit, Mich.	20-31			1.35														*			
Devils Lake, N. Dak.	28-29			0.22														*			
Dodge City, Kans.	31			0.10														*			
Dubuque, Iowa.	26-27			0.89														*			
Duluth, Minn.	25-27			1.41														*			
Durango, Colo.	27-28			2.56														*			
Eastport, Me.	2-3			0.66														*			
Elkins, W. Va.	10-11			1.64														.29			
El Paso, Tex.	19-20			0.61														.19			
Erie, Pa.	1-2			0.42														*			
Escanaba, Mich.	12-13			0.59														*			
Eureka, Cal.	22-23			2.28														.31			
Evansville, Ind.	28-29			3.46														.61			
Flagstaff, Ariz.	26-28			3.92														*			
Fort Smith, Ark.	26-27	12:16 p. m.	D. N. a.m.	2.68	9:18 p. m.	9:42 p. m.	1.56	.10	.21	.30	.55	.62						*			
Fort Wayne, Ind.	29-31			1.97														*			
Fort Worth, Tex.	19-21			1.19														.51			
Fresno, Cal.	5			0.35														.28			
Galveston, Tex.	2			0.51														.45			
Grand Haven, Mich.	19-21			1.02														*			
Grand Junction, Colo.	28			0.15														.11			
Grand Rapids, Mich.	20-22			1.07														.27			
Green Bay, Wis.	26-27			0.73														*			
Hannibal, Mo.	11-12			1.94														*			
Harrisburg, Pa.	29-30			0.36														*			
Hartford, Conn.	2			0.50														*			
Hatteras, N. C.	13-14			0.40														.18			
Havre, Mont.	24-26			0.88														*			
Helena, Mont.	3-4			0.43														*			
Houghton, Mich.	1			0.93														*			
Houston, Tex.	2			1.02														.35			
Huron, S. Dak.	1			0.95														*			
Independence, Cal.	1-2			2.41														*			
Indianapolis, Ind.	28-31			2.60														*			
Iola, Kans.	20-21			1.82														*			
Jacksonville, Fla.	13			0.42														.42			
Kalispell, Mont.	3-4			0.61														*			
Kansas City, Mo.	20-21	9:40 p. m.	4:45 a. m.	0.93	10:14 p. m.	10:30 p. m.	.04	.10	.30	.38	.42							*			
Keokuk, Iowa.	20-21			1.43														*			
Key West, Fla.	5	D. N. a.m.	D. N. a.m.	0.56	4:28 a. m.	4:42 a. m.	.04	.12	.39	.52								*			
Knoxville, Tenn.	5-7			1.57														*			
La Crosse, Wis.	26-27			0.85														*			
Lander, Wyo.	27-28			0.91														*			
Lansing, Mich.	11-12			0.87														*			
Lewiston, Idaho.	24-25			0.52														*			
Lexington, Ky.	28-29			1.13														*			
Lincoln, Nebr.	25-27			0.76														*			
Little Rock, Ark.	27-28			3.47														.54			
Los Angeles, Cal.	16-18	1:05 p. m.	9:30 a. m.	5.74	3:17 a. m.	3:29 a. m.	2.13	.20	.42</td												

TABLE II.—Accumulated amounts of precipitation for each 5 minutes, for the principal storms in which the rate of fall equaled or exceeded 0.25 inch in any 5 minutes, or 0.80 in 1 hour, during January, 1916, at all stations furnished with self-registering gages—Continued.

\* Self-register not working.

**† Record partly estimated.**

† No precipitation occurred during month.

TABLE III.—*Data furnished by the Canadian Meteorological Service, January, 1916.*

Stations.	Altitude above M. S. L.* (Jan. 1, 1916.)	Pressure.			Temperature.						Precipitation.		
		Station reduced to mean of 24 hours.	Sea-level reduced to mean of 24 hours.	Depart- ture from normal.	Mean max. + mean min. + 2.	Depart- ture from normal.	Mean maxi- mum.	Mean mini- mum.	Highest.	Lowest.	Total.	Depart- ture from normal.	Total snowfall.
		Feet.	Inches.	Inches.	Inches.	°F.	°F.	°F.	°F.	°F.	Inches.	Inches.	Inches.
St. Johns, N. F.	125	29.58	29.72	-0.14	21.8	-2.0	27.6	15.9	46	4	2.91	-3.00	16.0
Sydney, C. B. I.	48	29.94	29.98	+ .03	23.8	+ 3.3	31.8	15.9	46	-3	1.62	-3.48	12.0
Halifax, N. S.	88	29.97	30.08	+ .11	23.8	+ 2.0	33.0	14.6	55	-5	2.87	-2.90	14.9
Yarmouth, N. S.	65	30.02	30.09	+ .09	26.8	+ 0.5	33.3	20.3	45	5	2.90	-2.51	21.3
Charlottetown, P. E. I.	38	29.99	30.03	+ .07	19.2	+ 2.2	26.2	12.1	41	-8	2.67	-1.29	19.4
Chatham, N. B.	28	30.04	30.07	+ .10	15.0	+ 5.2	25.4	4.5	49	-14	2.47	-1.12	16.7
Father Point, Que.	20	30.04	30.07	+ .09	13.4	+ 5.4	22.0	4.9	43	-12	2.02	-0.83	17.0
Quebec, Que.	296	29.77	30.11	+ .09	12.4	+ 3.3	21.4	3.5	44	-18	4.45	+0.44	29.3
Montreal, Que.	187	29.89	30.11	+ .07	19.1	+ 7.4	27.4	10.8	45	-9	4.15	+0.42	17.7
Stonecliffe, Ont.	489	29.45	30.08	+ .06	13.8	+ 7.4	26.5	1.2	44	-25	3.53	+1.21	26.7
Ottawa, Ont.	236	29.84	30.19	+ .16	17.6	+ 8.0	27.3	7.9	44	-16	3.97	+0.98	15.0
Kingston, Ont.	285	29.81	30.14	+ .09	25.6	+ 8.5	33.1	18.2	44	-7	3.87	+0.42	9.7
Toronto, Ont.	379	29.69	30.09	+ .04	30.1	+ 8.7	37.1	23.0	53	1	2.50	-0.42	3.1
White River, Ont.	1,244	28.62	30.01	.00	3.0	+ 0.7	16.8	-10.9	39	-51	4.50	+2.81	45.0
Port Stanley, Ont.	592	29.48	30.14	+ .07	29.0	+ 6.8	35.8	22.2	48	-2	5.56	+2.57	6.2
Southampton, Ont.	656	29.34	30.07	+ .04	27.8	+ 7.4	35.4	20.3	59	1	5.25	+1.20	15.1
Parry Sound, Ont.	683	29.33	30.06	+ .05	22.4	+ 9.6	31.5	13.3	46	-15	6.10	+2.02	42.8
Port Arthur, Ont.	644	29.32	30.07	.00	6.6	+ 3.5	17.5	-4.4	37	-27	1.95	+0.60	19.5
Winnipeg, Man.	760	29.28	30.18	+ .07	-6.8	0.0	1.8	-15.4	22	-41	3.36	+2.48	33.6
Minnedosa, Man.	1,690	28.20	30.16	+ .06	-9.6	-2.4	-0.9	-18.6	20	-40	1.18	+0.38	11.8
Qu'Appelle, Sask.	2,115	27.72	30.17	+ .09	-12.9	-9.1	-4.6	-21.2	20	-46	1.10	+0.60	11.0
Medicine Hat, Alberta.	2,144	27.77	30.34	+ .17	-11.5	-17.0	-2.0	-21.0	30	-48	0.53	-0.04	5.3
Swift Current, Sask.	2,392	27.41	30.21	+ .12	-12.6	-15.7	-3.4	-21.9	27	-49	2.70	+2.06	27.0
Calgary, Alberta.	3,428	28.40	30.25	+ .22	-7.8	-16.2	1.7	-17.2	36	-41	0.79	+0.26	7.9
Banff, Alberta.	4,521	25.22	30.23	+ .23	-13.1	-25.2	-1.0	-25.2	19	-46	2.85	+1.66	29.5
Edmonton, Alberta.	2,150	27.77	30.26	+ .23	-12.6	-14.4	-3.5	-21.6	29	-45	1.09	+0.41	10.9
Prince Albert, Sask.	1,450	28.50	30.20	+ .11	-15.0	-6.6	-6.9	-23.1	17	-53	0.96	-0.01	9.6
Battleford, Sask.	1,592	28.37	30.27	+ .19	-15.6	-9.7	-7.0	-24.1	20	-61	0.76	+0.36	7.6
Kamloops, B. C.	1,262	28.83	30.23	+ .27	-3.0	-26.0	3.3	-9.5	32	-28	0.65	-0.17	6.5
Victoria, B. C.	230	29.59	29.85	- .12	29.5	-9.0	33.8	25.2	48	15	4.21	-1.18	30.2
Barkerville, B. C.	4,180	25.51	30.08	+ .19	-9.0	-26.8	-1.5	-16.4	21	-40	1.40	-1.20	14.0
Hamilton, Bermuda.	151	30.16	30.33	+ .20	60.0	-2.0	65.9	54.1	71	46	1.70	-3.24	-----

\*The altitudes given above were furnished by the Director of the Canadian Meteorological Service, March 9, 1916, and refer to cisterns of barometers at the respective stations. Where sea-level pressures and departures are omitted new reduction factors are in course of computation.—C. A., Jr.

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